

21st Australian International Aerospace Congress

24 – 26 March 2025 | Melbourne Convention and Exhibition
Centre & Avalon Airport



ENGINEERS
AUSTRALIA

Day 1 – Monday 24 March			
Time	Plenary room 1		
8.45	Congress opening		
9.05	Overcoming adversity in complex defence development projects: insights from Australia's Ghost Bat and Ghost Shark Dr Shane Arnott and Dr Andrew Glynn (Anduril Australlia)		
9.35	United in the Skies: the power of US-Australia aerospace research partnerships and international university collaborations Dr Geoff Anderson (US Space Force Research) and Dr David Newell (Asian Office and Research Development)		
10.05	ASA presentation Further information to be available shortly		
10.35	Morning tea		
Time	Plenary room 1	M101 & M102	M103
	AAC: Structures and materials	AAC: Autonomous systems / UAS	AAC: Airworthiness and sustainment
11.00	111: Beyond Horizons: NLR's contribution to shaping tomorrow's aerospace frontiers Mr Marcel Bos (Royal NLR)	Keynote presentation Amanda Holt (SyPAQ Systems)	Keynote presentation: 149: Royal Australian Navy embarked un-crewed aircraft system flight trials - a decade in review Dr Gareth Forbes (AMAFTU)
11.30	56: A method for imparting small scale damage for damage tolerance testing Mr Isaac Field (Defence Science & Technology Group)	17: Autonomous close formation flight control using optical flow Mr Jonathan Dansie (Defence Science & Technology Group)	1: Automated aircraft defect tracking utilising maintenance and pilot reports Mr Michael Scott (RMIT University)
11.50	150: Manufacturing and testing functional composite antenna structures for uncrewed aerial systems Dr Mitch Dunn	28: Autonomous aerial deployment systems for fixed-wing aircraft Dr Artur Medon (Defence Science & Technology Group)	103: Governance, regulations and innovation challenges in the Australian General Aviation Mr Craig Dows (RMIT University)
12.10	167: Leveraging QF results for enhanced fleet strategy optimisation: an applied science approach Mr Stefano Argentero (RUAG)	29: Relative localisation of fixed wing UAVs with ultraviolet LED markers Dr Blake Mcivor (Defence Science & Technology Group)	139: Efficient transfer learning across domains and data modalities for aircraft sustainment Dr Stacey Carter (RMIT University)
12.30	8: Developments in determining the closure free da/dN Versus ΔK_{eff} Curve Dr Rhys Jones (Monash University)	31: Informative path planning for UAV self-localisation Dr John Mcguire (Department of Defence)	69: UAVs, are they fit for humanitarian purpose? Miss Carina Koutsambasis (RMIT University)
12.50	Lunch		

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10.05	ASA presentation Further information to be available shortly		
10.35	Morning tea		
Time	M104	M105	M106
	NSES: Spacecraft dynamics and control I	AAC: Propulsion and aerospace systems	HUMS: Machine condition monitoring
11.00	Keynote presentation: Prof. Sabine Klinkner (University of Stuttgart)	Keynote presentation: Dr Eric Manrineau (Office of Naval Research Naval Air Warfare and Weapons)	Keynote presentation 1: HUMS enabling predictive maintenance: transforming commercial helicopter operations Dr. Eric Bechhoefer (GPMS, USA)
11.30	25: Shaping the future: state-of-the-art space sensors, based on Synthetic Aperture Radar (SAR) and agile platforms Ms Jaione Martinez, Mr Luis Guerra	35: Thermal cracking effects on mixing of JP-10 in a scramjet combustor Dr Magesh Ravindran (ASC Pty Ltd)	162: Automating vibration analysis: optimised multi-delay filters for improved signal separation Mr Cédric Peeters
11.50	32: An overview of emerging technologies in the context of the Australian Space Industry Mr Teddy Zvidza & Miss Isabella Federle (Nova Systems)	42: Commissioning of a supersonic test facility at UniSQ Dr Phillip Swann	14: Understanding the influence of the load zone on the vibrations excited by discrete faults in rolling element bearings Dr Iain Epps (Mobolo Technology Ltd)
12.10	80: Exploring efficiency of inertial morphing in attitude control of spinning smart prototype: journey from concept to Experimental Reality Mr Suraj Aranha	64: Emerging air-breathing propulsion systems for high-speed flight A/Prof Adrian Pudsey	156: Automatic peak detection algorithm for gearbox monitoring Mr Jean-Frederic Diebold
12.30	86: Dynamic modelling of the lunar lander toppling Prof Pavel Trivailo (RMIT University)	78: An overview of high-speed jet noise in aerospace-propulsion applications. A/Prof Daniel Edgington-Mitchell (Monash University)	38: Treatment of erroneous interference effects from post-processed planet gear vibration signals Dr Nader Sawalhi (Defence Science & Technology Group)
12.50	Lunch		

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Day 1 – Monday 24 March			
Time	Plenary room 1	M101 and M102	M103
1.30	Keynote presentation Dr Sam Meure (Department of Defence)	Keynote presentation Ms Kisa Christensen (BAE Systems)	Keynote presentation Dr Les Cohen (The Aerospace Corporation)
Time	Plenary room 1	M101 and M102	M103
	AAC: Structures and Materials	AAC: Autonomous Systems / UAS	AAC: Aerodynamics and Flight Mechanics
2.10	9: Predicting the growth of small cracks in wire arc additively manufactured (WAAM) CP-Ti Dr Rhys Jones (Monash University)	55: System identification and control tuning of the Wanderer UAS Mr Oliver Wykes (Defence Science & Technology Group)	161: Ground vibration testing and dynamic model updating for a collaborative combat aircraft Mr Michael Reece (Boeing Aerostructures Australia)
2.30	140: Enhancing the fatigue performance of AM components with minimal intervention. Mr Jason Rogers	60: Koopman Expectation for range safety assurance Ms Emma Comino (Shoal Group Pty Ltd)	75: Planar and two-dimensional linear stability theory on modelling rectangular jet Mr Grant Lu (Monash University)
2.50	178: Ensuring airworthiness of additive manufactured parts and repairs for the Australian Defence Force Prof Beau Krieg	65: Fixed-wing UAV system for aerial tethered delivery of small to medium packages Mr Samuel Ord	94: Experimental analysis of near and far field wingtip vortex using particle tracking velocimetry Ms Merina Mwasandube (RMIT University)
3.10	141: Numerical flow analysis of TPMS Gyroid porous media: drag and pumping power Mr Sean Samson (RMIT University)	91: Towards the transition manoeuvre of lift-cruise configuration eVTOL Ms Ridhima Kaul (AIAA)	105: A numerical investigation of the interaction between shock buffet and freeplay nonlinearity Dr Michael Candon
3.30	131: Energy storage composites with nanomaterial functionalization Mr Venkatesh Gangipamula (Swinburne University)	85: Development and testing of a fixed-wing UAV swarm system for large-area monitoring Dr Matthew Marino (RMIT University)	152: A physics-based approach for flutter mitigation in highly flexible wings A/Prof Aditya Paranjape (Monash University)
3.10	Afternoon tea		

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13.30	Keynote presentation Dr Sam Meure (Department of Defence)	Keynote presentation Ms Kisa Christensen (BAE Systems)	Keynote presentation Dr Les Cohen (The Aerospace Corporation)
Time	M104	M105	M106
	NSES: Spacecraft systems Design and Analysis I	HUMS: Data challenge Session 1	HUMS: Sensors, SHM and HUMS
2.10	10: Modelling potential distribution for a neutraliser-free ion thruster. Phillip Dowling (Australian National University)	121: The HUMS2025 data challenge dataset Wenyi Wang (Defence, Science & Technology Group)	26: An improved wireless vibration sensor for real time, in-situ rotorcraft gearbox condition monitoring Dr George Jung (Defence Science & Technology Group)
2.30	11: Coulomb force computation between an ion thruster and plume particles Phillip Dowling (Australian National University)	HUMS: Data Challenge Further details available shortly	68: Improving the extreme temperature measurement capability of FBG sensors encapsulated in low thermal expansion materials Mr Gerard Natividad (Defence Science & Technology Group)
2.50	34: Lunar wheel design optimisation Dr Quentin Michalski (RMIT University)		51: Architecture for a low cost, light weight HUMS for commercial helicopters Dr Eric Bechhoefer (GPMS, USA)
3.10	41: Buccaneer Main Mission concept of operations Mr Harrison Bennett (Defence Science & Technology Group)		112: A review of the improvements made to the F/A-18 fatigue tracking system: individual aircraft tracking with a safe life philosophy Mr Mathew Phillips (Defence Science & Technology Group)
3.30	72: The effect of phase change material on the performance of heat sinks for small satellites thermal management: an experimental study Mrs Laryssa Sueza Raffa (University Technology of Sydney)		45: Formulation and validation of an aircraft health monitoring tool for the MH-60R/S Fleet Miss Katie Krohmaly (US Navy, USA)
3.50	Afternoon tea		

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Time	Plenary room 1	M101 & M102	M103
	AAC: Structures and materials	AAC: Autonomous systems / UAS	AAC: Aerodynamics and flight mechanics
4.10	5: The impact on thin-shell buckling theory of the use of an erroneous expression for shear strains in curvilinear co-ordinates Dr Leonard John Hart-Smith	93: Boosting drone and AAM propeller efficiency: exploring novel boundary layer tripping techniques Mr Nitish Kumar Kamalahasan (RMIT University)	107: A Data-driven reduced order model for trajectory prediction of transonic cavity store release Mr Arpan Das (RMIT University)
4.30	44: Through-thickness dielectric cure monitoring for thermoset composites manufacturing cost reduction Dr Molly Hall (University of Southern Queensland)	130: Warm-starting of pseudospectral trajectory optimisation for improved performance Dr Kendall Taylor (RMIT University)	108: Predicting trajectory repeatability in unsteady flow conditions: refining J-factor for store certification Mr Errol Hale (RMIT University)
4.50	73: Artificial Intelligence of Things (AIoT) framework for composites 4.0 Dr Boon Xian Chai (Swinburne University of Technology)	138: UAV Path Planning for Pest Bird Deterrence using Bézier Curve Dr Zihao Wang (University of Sydney)	110: Optimising Asset Placement in IAMD Scenarios Ms Emma Comino (Shoal Group)
5.10	129: Microscale multifield analyses of composite materials using CUF Miss Rebecca Masia (Politecnico di Torino)	145: A design optimisation framework for small Uncrewed Aerial Vehicles Mr Juan Rasines Mazo (University of Sydney)	113: Stabilising extended dynamic mode decomposition using parsimonious mode selection criterion Mr Arpan Das (RMIT University)
End of Day 1			
6.30 – 10.30	<p style="text-align: center;">HUMS dinner <i>The Bank on Collins – 394 Collins Street, Melbourne VIC 3000</i></p>		

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Day 1 – Monday 24 March			
Time	M104	M105	M106
	NSES: Spacecraft dynamics and control II	HUMS: Data challenge session 2	HUMS: Diagnostics, prognostics, ODA
4.10	176: Ground-penetrating radar for mapping LavaTubes on the moon Prof Gail Iles (RMIT University)	HUMS: Data challenge Further details to be available shortly	109: New applications of cepstrum analysis in machine diagnostics Prof Bob Randall (University of New South Wales)
4.30	155: Discovery of the quaternion patterns while studying spinning spacecrafts in flipping motions Prof Pavel Trivailo (RMIT University)		37: Planet gear crack fault detection and propagation tracking using FRESH filters Mr Rik Vaernberg (KU Leuven, Belgium)
4.50	179: A Solar vacuum ultraviolet source for space environment simulations Prof Josef Richmond (Australian National University)		165: Comparison of bearing spall and fault diagnostics using inline oil debris monitoring Mr Nick Breeuwer (Gastops, Canada)
5.10	180: Regolith charging and lofting on the lunar surface: laboratory simulations of the lunar dayside Prof Josef Richmond (Australian National University)	122: Benchmark analyses of the HUMS2025 data challenge dataset Dr Nader Sawalhi (Defence Science & Technology Group)	166: Fluorescence spectroscopy for inline oil contamination and condition monitoring to improve HUMS Mr Nick Breeuwer (Gastops, Canada)
End of Day 1			
6.30 – 10.30	HUMS dinner <i>The Bank on Collins – 394 Collins Street, Melbourne VIC 3000</i>		

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Day 2 – Tuesday 25 March			
Time	Plenary room 1		
9.00	Welcome to Day 2		
9.05	The X-59 Low Boom Flight Demonstrator (LBFD): a structures perspective Dr Walter A Silva (NASA)		
9.35	Regulating Defence aviation safety in the decade ahead AIRCDRE James Badgery (DASA)		
10.05	Plenary presentation Dr Michael Frater (SkyKraft)		
10.35	Morning tea		
Time	Plenary room 1	M101 & M102	M103
	AAC: Structures and Materials	AAC: Autonomous Systems / UAS	NSES: Mission and Trajectory Design
11.00	Keynote presentation Dr Chiara Bisagni (Politecnico di Milano)	Keynote presentation Dr Emily Hilder (Advanced Strategic Capabilities Accelerator)	Keynote presentation Dr Delphine Spaterna (Thales Group)
11.30	48: Laser powder bed fusion of tantalum: hafnium-carbide for hypersonic thermal protection systems Mr Michael Ives (RMIT University)	148: Development of a modelling framework for swarms of drones with obstacle avoidance capabilities Mr Thotage Madhupa Kalhara (RMIT University)	174: Australian participation in the Milo Mission academy for lunar exploration Gail Iles (RMIT University)
11.50	46: Thermophysical properties of a high-density carbon/carbon composite for hypersonic platforms at ultra-high temperatures Marco Attia (Defence Science & Technology Group)	164: Drone Racing's utility to contemporary operations as FPV kamikaze loitering UAV munitions and the next tech leapWGC Dr Keirin Joyce (Royal Australian Air Force)	74: On leveraging ballistic Lunar Transfers to devise cis-lunar transfers from the Lunar Gateway Dr Kawsihen Elankumaran (Australian National University)
12.10	7: An on-board independent sensing system for in-flight aircraft empennage buffet measurement Mr Michael Scott (RMIT University)	24: A3TESS – A virtual proving ground for UAS computer vision-based object detection and localisation algorithms Mr Siddhant Tandon (Defence Science & Technology Group)	172: Investigating the effectiveness of passive radiation shielding against space radiation using OLTARIS Gail Iles (RMIT)
12.30	19: Measurement of extreme temperatures and strains using distributed fibre optic sensors Mr Julian McIntyre (Defence Science & Technology Group)	101: Optimising control for camber morphing wings: unlocking new levels of UAV efficiency Dr Matthew Marino (RMIT University)	154: Analysis of lunar navigation services for availability on the surface and in the low lunar orbit Dr Rohan Kapoor (Royal Aeronautical Society)
12.50	Lunch		

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10.35	Morning tea		
Time	M104	M105	Mr Zane Hills
	AAC: New technologies	HUMS: AI-based predictive maintenance solutions	Further details to be available shortly
11.00	Keynote presentation Dr Bjorn Nagel (DLR)	2: Methodologies for the design of health indicators Prof. Jerome Antoni (INSA-Lyon, France)	3: Digital engineering and digital twins to drive collaborative microelectronics design Mr Steve Carslon (Cadence)
11.30	115: Leveraging high-fidelity multi-physics computer simulations in the development of electro-optical/infra-red sensors for the detection and tracking of a vehicle for counter-hypersonic applications Dr Valerio Viti (Ansys)	12: Physics-informed neural network for explainable gear condition monitoring Nico Herwig (University of New South Wales)	6: A new approach for the analysis of long cylinders buckling under external pressure Dr Leonard John Hart-Smith
11.50	117: Harnessing the power of GPUs for aerospace simulations Dr Lewis Clark (Leap Australia)	4: A spatiotemporal data fusion technique for aircraft environmental and operational condition (EOC) Representation Wei Yin Chia (RMIT University)	18: Early crack detection with distributed fibre optic sensors on an F/A-18 Hornet Centre-barrel. Mr Zane Hills
12.10	98: The single-step and simplified Lattice Boltzmann method for aerospace and maritime applications Dr Arturo Delgado-Gutierrez (RMIT University)	89: Concept and challenges of AI-based fault diagnosis algorithm for rotorcraft Dr Seon Ho Jeong (Korea Aerospace Industries)	49: Metal Matrix Composite Syntactic Foam (MMCSF): a wonderful choice for lightweight structural applications Mr Shashank Kumar Srivastava (RMIT University)
12.30	106: PyFSI – A Python-based Fluid-Structure Interaction code: recent developments in nonlinear modelling Dr Michael Candon (RMIT University)	92: Blind peak detection in vibration spectra using region-based convolutional neural networks for instantaneous angular speed estimation Mr Georgios Protopapadakis (Vrije Universiteit Brussel)	
12.50	Lunch		

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Day 2 – Tuesday 25 March			
Time	Plenary room 1		
13.30	Panel on Diversity and STEM pipeline Further information to be available shortly		
Time	Plenary room 1	M101 and M102	M103
	AAC: Structures and materials	AAC: Aerodynamics and flight mechanics	NSES: Spacecraft systems design and analysis II
2.10	147: A thermoelastic stress analysis and coupled modelling approach for improved structural testing and evaluation Dr John Codrington (University of Adelaide)	116: Experimental unsteady aerodynamic loads on an aerofoil covering pre- and post-stall conditions Mr Christopher Brown (RMIT University)	83: Orbit determination concept of CubeSat in cislunar space by asynchronous one-way ranging Mr Shingo Nishimoto (Australian National University)
2.30	21: Optical fibre sensing for enhanced system state awareness Ms Suzanna Turk (Defence, Science & Technology Group)	104: Technical outcomes from the Helicopter Advanced Fatigue Test – Technology Demonstrator (HAFT-TD) program Mr Geoff Swanton (Defence, Science & Technology Group)	90: A study on positioning service to the vehicles on or around a celestial body Prof Junichiro Kawaguchi (School of Engineering)
2.50	22: Barely visible impact damage detection on an F/A-18 stabilator using line scan thermography Dr Shamron Prasad (Defence, Science & Technology Group)	118: Prediction of streaks in rectangular jets Mr Connor Marshall	97: Comparison of computational tools used for system optimisation in a millimetre wave inter-satellite link design study Mr Oliver Kirkpatrick (RMIT University)
3.10	39: Defect assessment in lattice structures using thermoelastic stress analysis Mr Joshua Rodrigues (RMIT University)	142: X – WING: achieving directional stability in an Uncrewed Aerial System (UAS) without a vertical tail Mr Nishanth Pradyumna (University of Sydney)	127: Building Australia’s Enduring Space Capability with iLAUNCH Dr Joni Sytsma (Outerloop Engineer)
3.30	134: A capability for rapid experimental validation of geometrically complex and safety critical aerospace structural components Prof Nik Rajic (1Millikelvin)	71: Autonomous formation flight of UAS using vector field navigation Samuel Ralph (Defence Science & Technology Group)	146: From Mobile Edge to Orbital Edge– a new space edge paradigm Mr Sam Hall
3.50	Afternoon tea		

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Day 2 – Tuesday 25 March			
Time	Plenary room 1		
13.30	Panel on Diversity and STEM pipeline Further information to be available shortly		
Time	M104	M105	M106
	AAC: Autonomous Systems/UAS	HUMS: Data Science & LLM Applications	Further details to be available shortly
2.10	30: AI large language models at the edge: Applications for UAV autonomy Dr Simon Crase (Defence Science & Technology Group)	169: ADaRA: Asset Damage Resolution Assistant Prof Daniel Wade (LMC Aviation)	52: Redesign of structural aerospace components for metal additive manufacturing using multi-objective topology optimisation Mr Christos Dionyssopoulos (Defence Science & Technology Group)
2.30	33: Ensuring safety in urban air mobility: addressing collision risks and structural integrity challenges Ms Chanya Charnsethikul (RMIT University)	168: Systems of agents Mr Nathon Regoni (LMC Aviation)	53: The flow induced noise of the finite wall mounted circular cylinders Miss Wenyu Chen
2.50	114: Collaborating to develop autonomous air systems Mr Ben Luther (NOVA Systems)	47: Using Natural Language Processing (NLP), a Machine Learning (ML) technique, to classify maintenance dataset Dr Eric Lee (Defence, Science & Technology Group)	57: An overview of the accelerated fatigue crack growth that underloads can cause in AA7050-T7451 Mr Isaac Field (Defence Science & Technology Group)
3.10	123: Multi-UAV separation assurance for dense urban air mobility operations Ms Yuting Xi (RMIT University)	157: Prediction method for remaining useful life based on BNN A/Prof Hongkun Li (Dalian University of Technology)	58: High-fidelity simulation of the double diaphragm forming process for aerostructures preforms Mr George Miris (Aerostructures Innovation Research Hub)
3.30	124: Design and manufacture of a fixed wing electric aircraft for cargo transport Dr Joni Sytsma (Outerloop Engineer)	158: Semi-supervised learning-based machinery anomaly detection: a case study with HUMS2023 dataset Mr Dhiraj Neupane (Deakin University)	61: Digital twins for training neural network wind shear prediction for urban air mobility Mr Nicolas Rayner & Mr Murray Owens (RMIT University)
3.50	Afternoon tea		

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Day 2 – Tuesday 25 March			
Time	Plenary room 1	M101 & M102	M103
	AAC: Structures and materials	AAC: Propulsion and aerospace systems	NSES: Launch vehicle design and methods
4.10	15: Filament winding of oxide ceramic material composites (OCCMC) – initial observations and considerations Dr Tristan Shelley (University of Southern Queensland)	126: Investigation of afterburner thrust augmentation performance for electric ducted fan UAS propulsion Dr Joni Sytsma (Outerloop Engineering)	98: How Australia can establish and sustain an internationally competitive industrial space engineering capability Peter Moar (Swinburne University)
4.30	40: High-temperature thermomechanical testing capabilities in the DSTG Fatigue and Fracture Laboratory Mr Joshua Rodrigues (Defence, Science & Technology Group)	82: Simultaneous velocity field measurements in a liquid jet with turbulent gas co-flow using two-phase PIV Mr Michael Pangestu (Monash University)	171: Australian model of a space station module for astronaut training Gail Iles (RMIT University)
4.50	102 - The post-impact multi-axial load response of aero-representative stiffened composite structures: experimental observations Mr Cooper Swann (RMIT University)	88: Impact of aerodynamic interactions on flutter onset in wings featuring distributed propulsion systems Mr Nils Böhnisch (RMIT University)	100: Numerical modelling of plasma assisted combustion for liquid rocket combustor using GCH4/GOX propellants Mr Abishek Shrestha (Dandelions)
5.10	132 - Effect of hygrothermal ageing temperature on the mechanical degradation of aerospace-grade carbon fibre epoxy laminates Dr Katherine Grigoriou (Monash University)	125: Optimisation of electric ducted fan performance Dr Joni Sytsma (Outerloop Engineering)	81: Development of a low cost space radiation spectrometer for small satellites (RAY) Mr Akash Katudia (Defence Science & Technology Group)
End of Day 2			
6.30 – 10.30	AIAC21 conference dinner Aerial South Wharf		

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Day 2 – Tuesday 25 March			
Time	M104	M105	M106
	AAC: MBSE and Digital Twins	HUMS: Data Science/Analytics	Further details to be available shortly
4.10	160: Model-based approach to aerodynamic database development for collaborative combat aircraft Mr Luca Brown (Boeing)	177: AI-based phase demodulation technique for fault diagnosis of rolling bearing under variable speed conditions Prof Mohamed Ismail (KFUPM, Saudi Arabia)	63: Enhancing damage tolerance in tufted composites: finite element modelling and predictions Mr Manatsawee Limprapuwattana (RMIT University)
4.30	120: FEA digital twin of a scarf repair for a composite component Dr Cam Minh Tri Tien (University of Southern Queensland)	67: Insights from using a rapidly deployable, wireless data acquisition system for non-intrusive flight test instrumentation Mr Sam Mancarella (MEMKO)	
4.50	66: A model-based systems engineering approach to deliver continued airworthiness through integrated working teams and datasets Mr Sam Mancarella (MEMKO)	144: Wildfire detection information management using sensor fusion Dr Rohan Kapoor (RMIT University)	
5.10		HUMS closing ceremony	
End of Day 2			
6.30 – 10.30	AIAC21 conference dinner <i>Aerial South Wharf</i>		

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Day 3 – Wednesday 26 March	
Time	Avalon Conference Centre
10.00	Welcome to Day 3
10.05	Keynote presentation Further information to be available shortly
10.55 – 11.55	Panel discussion Further information to be available shortly
11.55 – 13.30	Additional keynote and oral presentations Further information to be available shortly
End of Day 3	